SERIES 646 DIFFERENTIAL PRESSURE TRANSDUCER

Specifications - Installation and Operating Instructions

GENERAL
The Series 646 Differential Pressure Transducer is designed for use with air and compatible dry, inert gases and can accurately measure differential pressure down to ±0.5" H₂O. The transducer contains a fast response capacitance sensor and a unique isolation system ideal for VAV systems, filter monitoring, HVAC fan control, building pressurization and leak detection systems.

The Series 646 Differential Pressure Transducer features excellent repeatability, low hysteresis, accurate operation over a broad temperature range, and exceptional insensitivity to vibration, and increasing common mode line pressure. The high overpressure protection feature permits a continuous low reference pressure even with a sudden connection failure to a positive atmospheric pressure.

SPECIFICATIONS
Service: Compatible dry gases and air.
Output: 0.25 to 4.0 ±0.08 VDC @ 5.0V supply (0.5 to 4.25 ±0.12 for ±0.5" range).
Supply Voltage: 4.75 to 8.00 VDC.
Supply Current: 5 mA DC maximum.
Load: 25KΩ minimum recommended.
Output Impedance: <100Ω; short circuit protected.
Maximum Line Pressure: 1 psi.
Maximum Overload Pressure: High side (positive): 5 × rated pressure, Low side (negative): 3 × rated pressure.
Burst Pressure: 15 × psi (Hi & Lo sides) for ranges ±5.0 to ±10.0" H₂O; 15 × rated pressure (Hi side) and 5 × rated pressure (Lo side) for ranges ±0.5 to ±2.0" H₂O.
Accuracy (non-linearity): ±0.5% of span max.
Hysteresis and Repeatability: ±0.05% of span max.
Operating Temperature: 14 to 140°F (−10 to 60°C).
Compensated Temperature: 50 to 104°F (10 to 40°C).
Storage Temperature: −40 to 203°F (−40 to 95°C).
Response Time: 15 msec @ 63% full scale step response change.
Stability (1 year): ±1.0% of span.
Vibration: 10G’s peak to peak sinusoidal (10 to 500 Hz).
Shock: 50G’s, 1/2 sin wave, duration 11 msec without damage.
Thermal Effects: Zero and span: ±1.5% of span for ranges ±5.0 to ±10.0" H₂O; Zero and span: ±3.0% and ±4.0% of span respectively for ranges ±0.5 to ±2.0" H₂O @ 50 to 104°F (10 to 40°C).
Materials of Construction: Graphite filled, nylon housing, 96% of alumina ceramic sensor, silicone seal.
NOTE: Transducer housing contains graphite and is electrically conductive and connected to ground lead wire.
Electrical Connection: Three color-coded leads, 24 AWG, 12" length.
Weight: 2.5 oz (0.07 kg).

MODELS

<table>
<thead>
<tr>
<th>MODEL NUMBER</th>
<th>RANGE</th>
<th>MODEL NUMBER</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>646-0</td>
<td>±0.5&quot; H₂O</td>
<td>646-5</td>
<td>0 to 5&quot; H₂O</td>
</tr>
<tr>
<td>646-1</td>
<td>0 to 1&quot; H₂O</td>
<td>646-6</td>
<td>0 to 10&quot; H₂O</td>
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<tr>
<td>646-2</td>
<td>0 to 2&quot; H₂O</td>
<td>646-7</td>
<td>±5.0&quot; H₂O</td>
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<td>646-3</td>
<td>±1.0&quot; H₂O</td>
<td>646-8</td>
<td>±10.0&quot; H₂O</td>
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<tr>
<td>646-4</td>
<td>±2.0&quot; H₂O</td>
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INSTALLATION
Installation of the Series 646 is simplified with the use of molded mounting pads and color coded lead wires. Pressure connections will accept 1/8" to 3/16" I.D. tubing. See Table 1 below for the appropriate wiring connections. The unit should be mounted vertically with the pressure ports down to eliminate the effect of gravity error and avoid condensation inside the sensor.

Connections

<table>
<thead>
<tr>
<th>Cable Color</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLACK</td>
<td>Output</td>
</tr>
<tr>
<td>GREEN</td>
<td>Ground</td>
</tr>
<tr>
<td>RED</td>
<td>Supply Voltage</td>
</tr>
<tr>
<td></td>
<td>(Vs)</td>
</tr>
</tbody>
</table>

TABLE 1

OPERATION
The Series 646 Differential Pressure Transducers are factory calibrated at 5.00 ±0.002 VDC. No field calibrating is necessary. See Figure 1 below for output characteristics versus supply voltage.

APPLICATIONS
Variable Air Volume Systems
Filter Pressure Drop
Duct Air Flow
Clean Room Static Pressure Monitoring
Gaseous Leak Detection
Pneumatic Controls
Medical Equipment

MAINTENANCE
After final installation of the Series 646 Differential Pressure Transducer, no routine maintenance is required. Periodic checks of connections is recommended. Please contact Dwyer Instruments, Inc. before returning unit for repair to review information relative to your application. When returning a product to the factory, carefully package and ship freight prepaid. Be sure to include a complete description of the application and problem and identify any hazardous material used with the product.

ELECTRICAL CHARACTERISTICS

BIDIRECTIONAL PRESSURE % FULL SCALE

![Diagram of Electrical Characteristics](image1)

FIGURE 1